

Lack of High-School Math Seen Hindering Women, Minorities in Science

By JEAN EVANGELAUF

Women and members of minority groups are underrepresented in scientific disciplines for different reasons, and strategies to increase the number of female and minority Ph.D. recipients must take those differences into account, according to a report by the Rockefeller Foundation.

Overall and for whites, 30 per cent of the doctorates earned by U.S. citizens are in the quantitative disciplines—biological sciences, physical sciences, computer sciences, mathematics, engineering, and economics. For Hispanics and American Indians, 20 per cent of the doctorates are earned in those fields. For women the figure is 15 per cent, and for blacks, 10 per cent. About 60 per cent of the doctorates earned by Asians are in the quantitative disciplines.

"The pool from which quantitative Ph.D. students ultimately derive is essentially formed by the conclusion of high school," the Rockefeller report said. Few students who did not take the necessary mathematics courses in high school earned bachelor's degrees in scientific fields.

A major reason that blacks, Hispanics, and American Indians lack adequate high-school mathematics preparation and are underrepresented in science is that at least one of their parents did not attend college, the report said. Parents with some college experience are more likely to assume that their children will attend college, and they tend to take a more active role in planning their children's high-school education, the report added.

The following table shows the percentages of first-generation college freshmen (those whose parents did not attend college) and second-gen-

eration freshmen (those who reported that at least one of their parents had attended college) who chose a quantitative major in the fall of 1981:

	First generation	Second generation
American Indian	12.9%	19.0%
Asian American	41.2%	40.2%
Black	12.0%	19.5%
Chicano	15.2%	20.8%
Puerto Rican	12.1%	22.0%
White	17.2%	21.8%
All	16.7%	21.9%

Students whose parents attended college have wider career horizons and are equally likely to choose a quantitative field, regardless of their racial or ethnic group, the study

found. "As minorities move into the white-collar mainstream, their educational attainments and quantitative career choices should increase," the report said.

Because of the conflicting pressures of forming career preferences, training for those careers, and resolving their sexual identities, high-school girls often reject science and mathematics courses because they are "consistent with the development of masculine, but not feminine, identities," according to the report.

The report said, "In general, the public schools do not seem to serve any students particularly well in mathematics and science. . . . Iron-

ically, our attempts to give students more curricular choice in high school have resulted in reducing their post-secondary training and career options. Simply increasing mathematics and science graduation requirements—as some states have already done—would preserve them . . ."

The report—entitled *Who Will Do Science?*—was written by Sue E. Berryman, a staff member of the Rand Corporation. "It represents background material for the foundation's efforts in broadening career opportunities in science-based careers available to minorities and women," said Bernard E. Anderson, director of the foundation's social-

science division. The research was based on published statistics, specific and limited analyses of existing data bases, and published analyses.

Of those students who do have the appropriate high-school mathematics and science background, members of minority groups drop out of the academic "pipeline" that leads to a quantitative doctoral degree at different levels, the report said.

Black losses are dispersed across the pipeline. For example, blacks earn bachelor's degrees in scientific fields at 60 per cent of the national average, master's degrees at 40 per cent, and doctorates at 33 per cent of the national average.

For Hispanics and American Indians, the losses occur at high-school graduation and college entry.

In general, the report said, the members of those two groups who do enter college drop scientific studies at about the national rate at the bachelor's and master's level.

However, the report added that scientifically based professional-degree programs such as medicine, dentistry, optometry, and pharmacy "drain off" more of the scientific talent in the black and Hispanic groups than in other groups."

Women tend to drop out of the pipeline at the bachelor's level. They earn a quarter of the quantitative bachelor's degrees, but only 18 per cent of the master's degrees.

Those trends suggest that efforts to decrease attrition can be made at all levels of higher education, whereas efforts to increase the size of the pool should occur at the primary and secondary levels.

Who Will Do Science? is available free of charge from the Rockefeller Foundation, Information Service, 1133 Avenue of the Americas, New York 10036.

—SUSAN GOLDBERG

Michigan's Public Colleges Told to Pool Resources

DETROIT

Michigan's public colleges and universities must combine resources and eliminate overlapping programs to prevent some of them from going out of business, a state commission has reported.

The Governor's Commission on the Future of Higher Education, in its mid-year report, backed away from recommending that any of the state's 15 public four-year institutions be closed.

Closing of state colleges has been the subject of continuing debate among educators and lawmakers.

Moreover, said James Robinson, a Detroit lawyer who heads the 25-member commission, the group will probably not recommend the closure of any institution when it issues its final report to the governor in October.

However, unless something is done to restrict the institutions' activities in times of spiraling tuition,

falling enrollment, and unstable state financing, some colleges or universities may go out of business on their own, Mr. Robinson said.

"It is clear to the commission that the current configuration of the Michigan higher-education institutions and program offerings cannot be sustained at today's levels," the report said. "Attempting to maintain the status quo will only result in continued dispersion of resources and the erosion of quality."

The commission was appointed six months ago to study Michigan's 15 four-year colleges, 29 community colleges, and 56 private institutions and to make recommendations to guide them through the end of the century.

Among the preliminary recommendations:

► The institutions must more clearly define their roles and missions and concentrate their resources in specific areas. "You have 15 four-

year institutions and you can pick up their brochures and they all look like they're doing the same things," Mr. Robinson said.

► The commission underlined the need for coordinated, statewide planning, but it rejected the idea of a "superboard" to oversee each of the institutions' governing boards. Such a board—an idea widely criticized by university presidents—would be "neither politically practical nor administratively prudent," the report said.

► The state legislature should closely monitor the use of state money to prevent duplication of programs at state colleges and universities. At present, the institutions are free to use as they please much of the state money they receive.

► The institutions should place a moratorium on new programs until a statewide review of the colleges and universities is completed.

—SUSAN GOLDBERG

Community Colleges Step Up Their Pursuit of Funds from Private Sources

Continued from Page 1

year. They are not enough to keep shop and lab equipment up to date, to make salaries competitive with other colleges, or to furnish the need for new programs and ideas," says John W. Garrett, III, a director of the Rockingham Community College Foundation in North Carolina.

He says changing times require the college to change its method of financing, which has consisted primarily of relying on public funds. "If we want to improve on what we have already built—even to just keep it at the same level—we have got to have another source," says Mr. Garrett.

About 700 of the nation's 1,064 public two-year colleges now have nonprofit foundations, although only 185 to 190 of them are active in fund raising, says W. Harvey Sharron, Jr., dean for development at Santa Fe Community College in Florida and executive director of the college's endowment corporation, which he established about 15 years ago.

In 1978, when Mr. Sharron conducted a survey of the 1,037 public colleges in the 48 contiguous states, he found that 546 of them had separate foundations. About 80 per cent had been established in the late 60's and early 70's, usually about five years after the founding of their colleges.

In 1982, after another survey, Mr. Sharron concluded that "more community-college foundations were activated and established in 1980 and

1981 and in the first six months of 1982 than from 1900 to 1979."

Today, he says, "the typical community-college foundation—about 325 of them—has average assets of less than \$25,000. About 25 foundations have assets of \$1-million or more."

As a tax-exempt corporation operating at "an arm's length" from the institution, a community-college foundation can receive and disburse "significant private dollars without the cumbersome burden of state and federal regulations, rules, and mandates," Mr. Sharron pointed out in a handbook he edited for the National Council for Resource Development in Washington.

Freeing Up Public Dollars

The colleges can use foundation resources for programs and activities that are not funded in the operations budget or perhaps cannot legally be supported by state or local taxes. Some student financial aid or bonuses for faculty members might fall into that category.

"For every dollar a foundation raises, you free up a dollar in public money for the college," says Mr. Sharron.

Developing a successful nonprofit foundation is a subject of discussion among community-college presidents and development officers whenever they get together today. They debate what is the best type of corporation to establish, the role of

the college president, the selection of governing-board members, and the problems of raising money for a public, two-year institution.

"When you establish a new foundation, you have a couple of choices," says Kermit Lidstrom, president of Bismarck Junior College. "You can have a 'pass-through' foundation, where money is given to the foundation and the foundation writes a check to the college. Or you can have a 'pure endowment' foundation, where every dollar is kept forever and the income from the endowment is used for things."

The first type was not a success at Bismarck College, Mr. Lidstrom says, because "every time we got a couple thousand dollars, there was always a good reason to spend it. We were attacked from all sides."

Three years ago the college created an endowed foundation, which now has accumulated assets of more than \$1-million.

Presidents and development officers at colleges with foundations observe that a corporation's success depends a lot on how the college president views "resource development" and the role he plays in raising funds.

In both the college and the foundation, "resource development should be central to all your operations, never an appendage," says David E. Daniel, president of Wilkes Community College in North Carolina.

For the president, he says, "com-

munity involvement must be central. No one can take the place of the president in fund raising. I spend half my time away from the college doing just that."

"Fund raising is like milking a cow the old-fashioned way," adds Robert L. Stoddard, dean of development and former acting president at Snow College in Utah. "You can't call people on the phone or write them a letter. You have to sit down beside them and go to work."

At Snow College, which has a new foundation, Mr. Stoddard says, "the president spends one-third of his time working on development."

Directors Should Have Money

Since the purpose of foundation directors is "fund raising and fund raising," says Santa Fe's Mr. Sharron, the only people who should be on the board are those "who have money, who have access to money, or who manage money for others."

"It is a widely held misconception that the foundation board of directors should include socially prominent individuals or elected officials and should serve as an honorary post for past presidents of the college and former board-of-trustee members," says Mr. Sharron. While this may be good public relations, he says, "it is not good fund raising."

In what he calls "candid and realistic observations," Mr. Sharron advises that "the foundation's board of directors have no faculty members or

students. This is not a collegial organization."

He says foundations should also "forget about blacks, Indians, women, and mothers. The board has nothing to do with affirmative action."

He says, "Your business is fund raising."

In general, Bismarck's Mr. Lidstrom agrees.

"We used to have a lot of good old boys and good old girls who loved to be trustees and loved to come to meetings, but they never did a bit of work for the college."

For success, he says, "you need the best banker, the best attorney, the best major retailer, and the best physician" on the board.

When they start raising funds from the private sector, some community-college and foundation officials realize they must overcome obstacles that result from being what they are—public two-year institutions.

Among those obstacles is the view that private organizations should not give to public, two-year colleges because the institutions already receive support from tax funds. Or that alumni need not give money to their two-year college, since they give to the four-year institution where they completed their education.

Mr. Sharron, who says such views have contributed to the "slow evolution" of community-college fund raising in the private sector, thinks these perceptions are now "losing ground."